Citation:

Yoonhee C, Jung K, Eo E, Lee D, Kim J, Shin D, Kim S, Lee M. The relationship between alcohol consumption and injury in ED trauma patients. *Am J Emerg Med.* 2009 Oct;27(8):956-60.

PubMed ID: 19857414

Study Design:

Case-Control Study

Class:

C - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

NEUTRAL: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To evaluate the effects of alcohol consumption on injury type and severity in emergency department trauma patients in Korea.

Inclusion Criteria:

- Trauma patients admitted to emergency medical centers
- Informed consent

Exclusion Criteria:

- Subjects who arrived beyond 6 hours after trauma
- Subjects who continued to drink after trauma

Description of Study Protocol:

Recruitment

- Informed consent for screening and blood alcohol level (BAC) was requested from trauma patients admitted to 1 of 5 emergency medical centers between July 20, 2005, and October 20, 2005
- In cases where responding to a questionnaire was unfeasible, injury extent and BAC were determined before acquiring informed consent; if there was no improvement in clinical course, informed consent obtained from family
- In cases of death on arrival, only BAC was measured

Design: Case-control study

Blinding used (if applicable): not applicable

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Intervention (if applicable): not applicable

Statistical Analysis

- Comparison of categorical data: chi-square test
- Comparison of continuous data: Student's t-test; $P<0.05$ considered significant

Data Collection Summary:

Timing of Measurements: one measurement time

Dependent Variables

- Injury type and severity
  - consciousness level: Glasgow Coma Scale
  - cause of injury
  - anatomical diagnosis based on the international disease classification
  - length of hospitalization
  - injury severity:
    - Abbreviated Injury Scale (AIS): severe injury: score ≥ 3
    - Injury Severity Score (ISS): severe injury: score ≥ 15

Independent Variables

- Blood alcohol level (BAC)
  - intoxicated: level > 10 mg/dL (BAC-positive)
  - sober: level $\leq$ 10 mg/dL (BAC-negative)

Control Variables

Description of Actual Data Sample:

Initial N:

- N=1188 patients requiring admission; 827 did not provide consent

Attrition (final N): N=361, Male/Female ratio: BAC positive: 7.1:1; BAC negative: 2.1:1, $P<0.001$

Age:BAC positive: 39$\pm$13.7 years; BAC negative: 45.6$\pm$19.0 years, $P<0.001$

Ethnicity: Korean

Other relevant demographics: none specified

Anthropometrics

Location: South Korea

Summary of Results:

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Key Findings

- Average systolic blood pressure was 113.2±32.1 mmHg in intoxicated patients and 130.2±27.4 mmHg in sober patients (P<0.001)
- Head AIS score was significantly higher in intoxicated patients (1.1±1.7) compared to control patients (0.6±1.2), P<=0.008
- Mortality was significantly higher in intoxicated patients than in sober ones (6 deaths (5.7%) vs 5 deaths, (2.0%), P=0.003)
- There was a significantly higher number of intoxicated patients with severe injuries (21% intoxicated vs 11.7% sober, P=0.023), and specifically with severe head injuries (head AIS ≥3) (25.7% intoxicated versus 13.3% sober, P=0.004)
- Length of ICU admission was significantly higher in intoxicated patients (1.9±4.6 days) compared with sober patients (0.7±2.6 days).
- Injury severity tended to increase in patients with BAC levels less than 200 mg/dL, decrease in patients with BAC levels between 200 and 25 mg/dL, and increase again in patients with BAC levels 250 mg/dL or higher.

Other Findings

Causes of injury in BAC-positive and BAC-negative groups

	BAC positive (N=105)	BAC negative (N=256)	P
Traffic accidents (%)	31 (29.5)	81 (31.6)	.001
Slips (%)	26 (24.8)	67 (26.2)	
Falls (%)	9 (8.6)	33 (12.9)	
Penetrating trauma (%)	17 (16.2)	23 (9.0)	
Blunt trauma (%)	5 (4.8)	30 (11.7)	
Violence (%)	14 (13.3)	10 (3.9)	
Others (%)	3 (2.9)	12 (4.7)	

Author Conclusion:

In intoxicated patients, injury severity increases with marginal significance and head injury is significantly higher in intoxicated patients than in sober patients. Intoxicated patients have significantly higher mortality and longer admission to the ICU.

Reviewer Comments:

- *Very high percentage (about two-thirds) of patients did not provide informed consent; no information provided on these patients or reasons why informed consent not given.*
- *Five emergency medical centers had different criteria for admission*
- *Unclear how questionnaire was administered*

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Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions

1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	N/A
2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	Yes
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	N/A

Validity Questions

1.	**Was the research question clearly stated?**	Yes
1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	Yes
1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	Yes
2.	**Was the selection of study subjects/patients free from bias?**	No
2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	Yes
2.2.	Were criteria applied equally to all study groups?	Yes
2.3.	Were health, demographics, and other characteristics of subjects described?	Yes
2.4.	Were the subjects/patients a representative sample of the relevant population?	No
3.	**Were study groups comparable?**	Yes
3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	Yes
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	Yes
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	Yes

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3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	N/A
3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	Yes
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	**Was method of handling withdrawals described?**	Yes
4.1.	Were follow-up methods described and the same for all groups?	Yes
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	Yes
4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	Yes
4.4.	Were reasons for withdrawals similar across groups?	???
4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	N/A
5.	**Was blinding used to prevent introduction of bias?**	???
5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	N/A
5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	Yes
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	???
5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	N/A
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A
6.	**Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were interveningfactors described?**	Yes
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	N/A
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	Yes

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6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	Yes
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	N/A
6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	N/A
6.6.	Were extra or unplanned treatments described?	N/A
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	N/A
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	**Were outcomes clearly defined and the measurements valid and reliable?**	Yes
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	Yes
7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	Yes
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	Yes
7.5.	Was the measurement of effect at an appropriate level of precision?	Yes
7.6.	Were other factors accounted for (measured) that could affect outcomes?	Yes
7.7.	Were the measurements conducted consistently across groups?	Yes
8.	**Was the statistical analysis appropriate for the study design and type of outcome indicators?**	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes
8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	Yes
8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	N/A
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	N/A
8.6.	Was clinical significance as well as statistical significance reported?	Yes

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8.7.	If negative findings, was a power calculation reported to address type 2 error?	N/A
9.	**Are conclusions supported by results with biases and limitations taken into consideration?**	Yes
9.1.	Is there a discussion of findings?	Yes
9.2.	Are biases and study limitations identified and discussed?	Yes
10.	**Is bias due to study's funding or sponsorship unlikely?**	Yes
10.1.	Were sources of funding and investigators' affiliations described?	Yes
10.2.	Was the study free from apparent conflict of interest?	Yes

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